

REMARKS

Status of the claims

Claims 1, 23-28, 30-48 and 52-57 are pending as shown above and claims 25-28, 30-32, 36, 37, 39-41 and 53-57 are under consideration.

Restriction/Election

As previously acknowledged, the Restriction Requirement has been made Final. With regard to the remaining election of species requirements, Applicants again note that there upon indication that elected claim 30 is allowable, the withdrawn claims should be examined.

Objections/Rejections Withdrawn

Applicants note that the objections to the claims have been withdrawn. (Final Office Action, page 3). In addition the previous rejections under 35 U.S.C. §§ 102(e) and 103(a) have also been withdrawn. (Final Office Action, pages 3 and 12-14).

35 U.S.C. § 103

Barbas

Claims 25-28, 30-32, 36-37, 39-41 and 53-57 were newly rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over U.S. Patent No. 7,151,201 (hereinafter "Barbas") in view of Filippova (1996) *Mol. Cell Biol.* 16(6):2802-2813 (hereinafter "Filippova"). (Final Office Action, pages 3-7). Barbas was cited for allegedly teaching the elements of the claims except an isolated polynucleotide encoding a zinc finger protein as claimed and Filippova was cited for teaching the human CTCF protein, in which the 11th zinc finger has a CCHC structure. *Id.*

Because Barbas and Filippova do not establish that it was predictable to modify the recognition region of C3H zinc fingers having the claimed structure to bind to a gene in a plant cell, Applicants traverse the rejection and supporting remarks.

As set forth by the Supreme Court in *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398; 82 USPQ2d 1385, 1397 (2007) and Patent Office Guidelines regarding determining

obviousness issued in view of *KSR*, an obviousness rejection is only proper when the proposed combination of elements results in a predictable outcome (see, Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in view of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.*, Fed. Reg. Vol. 72, No. 195, October 10, 2007, emphasis added):

The rationale to support a conclusion that the claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one or ordinary skill in the art at the time of the invention.

Rather, the Supreme Court in *KSR* reiterated that an obviousness inquiry is fact-dependent and that “a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR*, 82 USPQ2d at 1389. The Federal Circuit has consistently reversed a finding of obviousness, even when all claimed elements are individually present in the references. See, e.g., *In re Kotzab*, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000).

It is also axiomatic that an obviousness rejection is improper where the proposed modification would destroy the intended function of the reference (see, e.g. *In re Fritch* 23 USPQ2d 1780, 1783, n.12 (Fed. Cir. 1992) and *In re Ratti* 123 USPQ 349, 352 (CCPA 1979)):

A proposed modification [is] inappropriate for an obviousness inquiry when the modification render[s] the prior art reference inoperable for its intended purpose.

[I]t would require a substantial reconstruction and redesign of the elements shown in [a cited reference] as well as a change in the basic principles under which [that reference's] construction was designed to operate.

In the instant case, there is no combination of Barbas and Filippova that establishes that the proteins encoded by the claimed polynucleotides were a predictable

use of allegedly known elements. Further, because the suggested modifications to Filippova would destroy the intended function of this reference's protein, the rejection cannot stand.

As admitted by the Office, Barbas fails to teach or suggest anything about non-canonical zinc finger domains set forth in claims 30 and claims dependent therefrom, namely zinc fingers having 2-4 amino acid residues between the amino terminal zinc coordinating residues and 1, 2, 3, 4, 6 or 7 amino acid residues between the carboxy terminal zinc coordinating residues. Thus, Barbas fails to teach using C3H backbones of the claimed structure.

Furthermore, there is absolutely nothing in Barbas that teaches it was predictable to modify the backbones and/or the recognition helices of mammalian C3H fingers to arrive at the claimed plant gene-binding proteins. As detailed previously on the record, Barbas discloses only one C3H finger (by reference to Terol). This protein has a different backbone structure than claimed, *i.e.*, 7 amino acids between the amino terminal cysteines. Moreover, the lone C3H finger disclosed in Barbas was not shown to be functional in plant cells in an unmodified form, let alone to bind to a gene in a plant cells when the recognition helix is modified (engineered), as claimed.

Accordingly, because Barbas's one and only mention of using C3H "backbones" is to the specific C3H plant zinc finger disclosed in Terol, and because it was not clear that this one C3H protein bound to DNA in its unmodified form, Barbas does not establish that non-canonical (C3H) fingers can be predictably modified in their recognition helix region for binding to plant genes.

As Barbas fails to teach the predictable use of engineered zinc finger proteins in any C3H fingers, the obviousness rejection can only be sustained if Filippova teaches zinc fingers of the claimed backbone structure could be predictably modified in the recognition helix region to bind to plant genes. In point of fact, Filippova fails to supply what is missing from Barbas. This reference does not teach anything about a zinc finger protein that binds to a plant gene or anything about modifying finger 11 (the C3H finger) of the CTCF protein. Rather, Filippova teaches that their unmodified zinc finger binds to the human *c-myc* promoter. Clearly, this is not a plant gene, as claimed.

Furthermore, there is nothing in Filippova that suggests a CTCF protein in which the recognition helix of the one C3H finger is modified would still bind to DNA, let alone that it would bind to a plant gene. In fact, modifying Filippova as suggested, namely to make a protein that binds to the human *c-myc* promoter bind to a plant gene, would destroy the intended function of Filippova's zinc finger. As such, the obviousness rejection is improper.

For at least the foregoing reasons, withdrawal of the rejection is in order.

Barbas II

Claims 25-28, 30-32, 36m 39-41 and 53-57 were also rejected as allegedly obvious over U.S. Patent No. 7,329,728 (hereinafter "Barbas II") in view of Filippova, as cited above. (Final Office Action, pages 7-10). Claim 37 was rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Barbas in view of Filippova and in further view of Guyer, which was cited as previously for allegedly disclosing GAL4-C1 fusion proteins. (Final Office Action, pages 10-12). While it was acknowledged that Barbas II does not teach isolated polynucleotides encoding a non-canonical zinc finger protein as claimed, Filippova was again alleged to teach this element. *Id.*

For the reasons noted above, there is no combination of Barbas and Filippova that teaches or suggests the claimed zinc finger proteins that bind to a plant gene. Barbas II does not teach a C3H protein of the claimed structure and does not teach that it was predictable to engineered recognition helices in the context of C3H proteins at all. Filippova teaches away from modifying the recognition helix of their protein and, indeed, modifying the recognition helix region of Filippova as suggested would destroy the intended function of this reference's protein.

For its part, Guyer teaches a hybrid transcription factor comprising the DNA binding domain of the *S. cerevisiae* GAL4 protein and the transcription activation domain of the maize C1. There is no discussion of non-canonical zinc finger components as claimed. Accordingly, Guyer fails to cure the deficiencies of Barbas, Jiang and Hori.

Thus, a *prima facie* case of obviousness has not been and cannot be established and the rejections should be withdrawn.

CONCLUSION

In light of the amendments and remarks presented herein, it is believed that the elected subject matter is in condition for allowance. Applicants therefore request examination of generic subject matter. If the Examiner believes that a telephone conversation would expedite prosecution, she is invited to contact the undersigned at the telephone number given below.

Respectfully submitted,

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